DEVELOPMENT OF AN ADVANCED IMPACT INTEGRATION PLATFORM FOR COOPERATIVE ROAD USE: THE @CRUiSE PROJECT

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The most direct impacts of road transport relate to traffic congestion, road safety, fuel consumption, greenhouse gases emissions, pollutants concentrations/air quality and noise levels. The implementation of environmental policies in the transportation sector should consider the level of contribution of each externality and its geographical scale. Thus, in a context of increasing data availability, a relevant research topic is to explore the nature of these dynamic externalities, in order to efficiently manage current road networks.

The fundamental goal of this 30-month project is to integrate road traffic impacts into a single analytical framework for use in advanced traffic management systems (ATMS). The work plan is founded on 3 main pillars: a) Designing a conceptual methodology for assigning a link-based indicator that can evaluate different traffic-related externalities, adjusted to local contexts of vulnerability; b) Improving the interoperability between traffic-related models and new sources of traffic information; c) Optimizing the network operations by means of a decision support system.

This research project is coordinated by Prof. Margarida Coelho and will be conducted within a multidisciplinary partnership between the Transportation Technology research group of the Centre for Mechanical Technology and Automation (TEMA), the research group on Emissions, Modelling and Climate Change of the Centre for Environmental and Marine Studies (CESAM) – both from the University of Aveiro (UA) – and the Aveiro Telecommunications and Networks Group (ATNoG) from the Institute of Telecommunications (IT).

The first specific task is the development of a GIS-based dynamic map structure that can assimilate both historical data and Dynamic (Floating Car) Data, integrated into a library of forecasting traffic models and associated traffic-related externalities (air pollution/climate, noise, and road conflicts). Instantaneous emissions and noise models will be integrated with existing traffic models. Subsequently several air quality scenarios will be analysed based on statistical models. The second task will be to enhance the potential of new sources of traffic information to improve network efficiency; this will be done by creating new methods for managing different sources of real-time information to determine as accurately as possible the energy/environmental network performance. Finally, the main deliverable of this project will be a prototype of an integrated decision support system for selecting the appropriate traffic management options for a certain region.

KEYWORDS: Sustainable traffic management, Eco-indicator, Externalities, Vulnerability, Floating car data.

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